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<120> METHOD AND DETECTOR FOR IDENTIFYING SUBTYPES OF HUMAN  
PAPILLOMA VIRUSES

<130> 4712-117 US

<140> 09/885,799

<141> 2001-06-20

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<170> PatentIn Ver. 2.1

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<211> 21  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 648  
ccaccaactg ccttagcacc c 21

<210> 649  
<211> 21

<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 649  
tgcagcgtac tccccacatc a

21

<210> 650  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 650  
gcccagactg tgggtggcag

20

<210> 651  
<211> 409  
<212> DNA  
<213> Human papillomavirus subtype 11 (6727-7135/409 bp)

<400> 651  
tatttgctgg ggaaaccact tgtttgttac tgtggtagat accacacgca gtacaaatat 60  
gacactatgt gcatctgtgt ctaaactctgc tacatacact aattcagatt ataaggaata 120  
catgcgccat gtggaggagt ttgatttaca gtttatTTTT caattgtgta gcattacatt 180  
atctgcagaa gtcatggcct atatacacac aatgaatcct tctgttttgg aggactggaa 240  
ctttggttta tcgctccac caaatggtac actggaggat acttatagat atgtacagtc 300  
acaggccatt acctgtcaga aaccacacc tgaaaaagaa aaacaggatc cctataagga 360  
tatgagtttt tgggaggtta acttaaaaga aaagttttca agtgaatta 409

<210> 652  
<211> 412  
<212> DNA  
<213> Human papillomavirus subtype 16 (6602-7013/412 bp)

<400> 652  
catttgttgg ggtaaccaac tatttgttac tgttgttgat actacacgca gtacaaatat 60  
gtcattatgt gctgccatat ctacttcaga aactacatat aaaaataacta actttaagga 120  
gtacctacga catggggagg aatatgattt acagtttatt tttcaactgt gcaaaataac 180  
cttaactgca gacgttatga catacatata ttctatgaat tccactatTT tggaggactg 240  
gaatttttgg ctacaacctc ccccaggagg cacactagaa gatacttata ggtttgtaac 300  
ccaggcaatt gcttgtcaaa aacatacacc tccagcacct aaagaagatg atccccctaa 360  
aaaatacact ttttgggaag taaattttaaa ggaaaaagttt tctgcagacc ta 412

<210> 653  
 <211> 415  
 <212> DNA  
 <213> Human papillomavirus subtype 18 (6578-6992/415 bp)

<400> 653  
 tgtttgctgg cataatcaat tatttggttac tgtggtagat accactccca gtaccaattt 60  
 aacaatatgt gcttctacac agtctcctgt acctgggcaa tatgatgcta ccaaatttaa 120  
 gcagtatagc agacatgttg aggaatatga ttgacagttt atttttcagt tgtgtactat 180  
 tacttttaact gcagatgtta tgtcctatat tcatagtatg aatagcagta ttttagagga 240  
 ttggaacttt ggtgttcccc ccccccaac tactagtttg gtggatacat atcgttttgt 300  
 acaatctgtt gctattacct gtcaaaagga tgcctgcaccg gctgaaaata aggatcccta 360  
 tgataagtta aagttttgga atgtggattt aaaggaaaag ttttcttttag actta 415

<210> 654  
 <211> 415  
 <212> DNA  
 <213> Human papillomavirus subtype 26 6553-6967/415 bp)

<400> 654  
 tatctgttgg ggcaatcaat tgtttggttac ctgtgttgat accaccogca gtactaacct 60  
 taccattagt acattatctg cagcatctgc atccactcca tttaaacat ctgattataa 120  
 acaatttata agacatggcg aagaatatga attacaattt atatttcagt tgtgtaaaat 180  
 aacacttaca acagatgtta tggcttacat acatttaatg aatgcctcca tattggagga 240  
 ttggaatttt ggactaacct tacctccac tgcctagtttg gaagatgctt ataggtttat 300  
 taaaaactct gctactacct gtcagcgtaa cgccctcct gtgccaaag aagatccttt 360  
 tcaaaaattt aaattttggg atgtagattt aaaagaaaaa ttttctattg atttg 415

<210> 655  
 <211> 412  
 <212> DNA  
 <213> Human papillomavirus subtype 31 (6520-6931/412 bp)

<400> 655  
 tatttggttg ggcaatcagt tatttggttac tgtggtagat accacacgta gtaccaatat 60  
 gtctgtttgt gctgcaattg caaacagtga tactacattt aaaagtagta attttaaaga 120  
 gtatttaaga catggtgagg aatttgattt acaatttata tttcagttat gcaaaataac 180  
 attatctgca gacataatga catatattca cagtatgaat cctgctattt tggaagattg 240  
 gaattttgga ttgaccacac ctccctcagg ttcttttgag gataacctata ggtttgtcac 300  
 ctacacggcc attacatgtc aaaaaactgc cccccaaaag cccaaggaag atccatttaa 360  
 agattatgta ttttgggagg ttaattttaa agaaaagtgt tctgcagatt ta 412

<210> 656  
 <211> 409  
 <212> DNA  
 <213> Human papillomavirus subtype 32 (6837-7245/409 bp)

<400> 656  
 tatatgttgg ggtaatcaag tgtttctaac tgttgtggat actaccogta gtactaacat 60  
 gactgtgtgt gctactgtaa caactgaaga cacatacaag tctactaact ttaaggaata 120  
 tctacgccat gcagaggaat atgatataca gtttatattt caattgtgca aaattacatt 180  
 atctgtagag gttatgtcat atatccacac catgaatcct gacatactag acgattggaa 240  
 tgttggtgta gctccaccgc cctctggtac tttagaagat agttatagat ttgtgcagtc 300

tcaggccata cgatgtcaag ctaaggtaac agcacctgaa aaaaaggatc ctttttctga	360
ctattcattt tgggaagtaa atttatctga aaagttttct agtgattta	409

<210> 657

<211> 409

<212> DNA

<213> Human papillomavirus subtype 33 (6559-6967/409 bp)

<400> 657

tatttggttg ggcaatcagg tatttggttac tgtggtagat accactcgca gtactaatat	60
gactttatgc acacaagtaa ctagtgacag tacatataaa aatgaaaatt ttaaagaata	120
tataagacat gttgaagaat atgatctaca gtttggtttt caactatgca aagttacctt	180
aactgcagaa gttatgacat atattcatgc tatgaatcca gatatttttag aagattggca	240
atttggttta acacctcttc catctgctag ttacaggat acctataggt ttgttacctc	300
tcaggctatt acgtgtcaaa aaacagtacc tccaaaggaa aaggaagacc ccttaggtaa	360
atatacattt tgggaagtgg atttaaagga aaaattttca gcagattta	409

<210> 658

<211> 412

<212> DNA

<213> Human papillomavirus subtype 35 (6542-6953/412 bp)

<400> 658

tatttggttg agtaaccaat tgtttggttac tgtagttgat acaaccgta gtacaaatat	60
gtctgtgtgt tctgctgtgt cttctagtga cagtacatat aaaaatgaca attttaagga	120
atatttaagg catgggtgaag aatatgattt acagtttatt ttccagttat gtaaaataac	180
actaacagca gatgttatga catatatcca tagtatgaac ccgtccattt tagaggattg	240
gaattttggc cttacaccac cgccttctgg taccttagag gacacatc gctatgtaac	300
atcacaggct gtaacttgtc aaaaaccag tgcacaaaaa cctaaagatg atccattaaa	360
aaattatact ttttgggagg ttgatttaaa ggaaaagttt tctgcagact ta	412

<210> 659

<211> 415

<212> DNA

<213> Human papillomavirus subtype 37 (6711-7125/415 bp)

<400> 659

cattttatgg ggtaatcaaa tgtttatcac agttgctgat aatacacgga acacaaactt	60
ttctattagt gtgtctactg acaatggcga agttacagaa tataattctc aaacactcag	120
agaataccta agacatgttg agaatacca gctttcaatt attttacaac tttgtaaagt	180
tcctttaaag gctgaggttt taactcagat aaatgcaatg aattctggta tattggaaga	240
gtggcaatta ggatttgtag ctactccaga taattcagta catgacctt ataggtagat	300
taattcaaa gctaccaagt gtccctgatgc agttgttgaa aaagaaaagg aagatccctt	360
tgcaaaatat acattttgga atgtagattt aactgaaaaa ttatcattgg attta	415

<210> 660

<211> 415

<212> DNA

<213> Human papillomavirus subtype 39 (6605-7017/415 bp)

<400> 660

tatatgttgg cataatcaat tatttcttac tgttggtggac actaccgta gtaccaactt	60
tacattatct acctctatag agtcttccat accttctaca tatgatcctt ctaagtttaa	120

ggaatataacc	aggcacgtgg	aggagtatga	tttacaat	atatttcaac	tgtgtactgt	180
cacattaaca	actgatgta	tgtttatat	tcacactatg	aattcctcta	tattggacaa	240
ttggaat	gctgtagctc	ctccaccatc	tgccagtttg	gtagacactt	acagatacct	300
acagtctgca	gccattacat	gtcaaaagga	tgctccagca	cctgaaaaga	aagatccata	360
tgacgggtcta	aagttttgga	atgttgactt	aagggaaaag	tttagtttgg	aactt	415

<210> 661

<211> 409

<212> DNA

<213> Human papillomavirus subtype 42 (6802-7210/409 bp)

<400> 661

tatatgtttgg	ggaaatcagc	tatttttaac	tgtgggtgat	actaccgta	gtactaacat	60
gactttgtgt	gccactgcaa	catctggtga	tacatataca	gctgctaatt	ttaaggaata	120
tttaagacat	gctgaagaat	atgatgtgca	atttatattt	caattgtgta	aaataacatt	180
aactgttgaa	gttatgtcat	atatacacia	tatgaatcct	aacatattag	aggagtggaa	240
tgttggtgtt	gcaccaccac	cttcaggaac	tttagaagat	agttataggt	atgtacaatc	300
agaagctatt	cgctgtcagg	ctaaggtaac	aacgccagaa	aaaaaggatc	cttattcaga	360
cttttggttt	tgggaggtaa	atztatctga	aaagttttct	actgattta		409

<210> 662

<211> 415

<212> DNA

<213> Human papillomavirus subtype 43 (21-435/415 bp)

<400> 662

catttgtttt	gggaatcagt	tgtttgttac	agtggtagat	accactcgta	gtacaaactt	60
gacgttatgt	gcctctactg	accctactgt	gccagtaga	tatgacaatg	caaagtttaa	120
ggaataacttg	cggcatgtgg	aagaatatga	tctgcagttt	atatttcaat	tatgcataat	180
aacgctaaac	ccagagggtta	tgacatatat	tcatactatg	gatcccat	tattagagga	240
ctggaat	ggtgtgtccc	cacctgcctc	tgcttctttg	gaagatactt	atcgcttttt	300
gtctaacaag	gccattgcat	gtcaaaaaaa	tgctcccca	aagggaacggg	aggatcccta	360
taaaaagtat	acattttggg	atataaatct	tacagaaaag	ttttctgcac	aactt	415

<210> 663

<211> 415

<212> DNA

<213> Human papillomavirus subtype 44 (6647-7061/415 bp)

<400> 663

tatttggttg	ggaaatcagt	tatttggttac	tgttgtagat	actaccgta	gtacaaacat	60
gacaatatgt	gctgccacta	cacagtcccc	tccgtctaca	tatactagt	aacaatataa	120
gcaatacatg	cgacatgttg	aggagtgtga	cttacaat	atgtttcaat	tatgtagtat	180
taccttaacg	gcggaggtaa	tggcctatct	tcatactatg	aatgctggta	ttttagaaca	240
gtggaacttt	gggttgctgc	cgcccccaaa	tggtagctta	gaggacaaat	acagatatgt	300
gcagtcccag	gccattacat	gtcaaaagcc	acccctgaa	aaggcaaagc	aggacccta	360
tgcaaaatta	agtttttggg	aggtgatct	tagagaaaag	ttttctagt	agttg	415

<210> 664

<211> 415

<212> DNA

<213> Human papillomavirus subtype 45 (6582-6996/415 bp)

<400> 664  
tatttgttgg cataatcagt tgtttgttac tgtagtggac actaccgcga gtactaattt 60  
aacattatgt gcctctacac aaaatcctgt gccaaagtaca tatgacccta ctaagtttaa 120  
gcagtatagt agacatgtgg aggaatatga ttacagttt atttttcagt tgtgcactat 180  
tactttaact gcagagggtta tgtcatatat ccatagtatg aatagtagta tattagaaaa 240  
ttggaatttt ggtgtccctc caccacctac tacaagtttg gtggatacat atcgttttgt 300  
gcaatcagtt gctgttacct gtcaaaaagga tactacacct ccagaaaagc aggatccata 360  
tgataaatta aagtttttga ctgttgacct aaaggaaaaa ttttcctcgg atttg 415

<210> 665

<211> 412

<212> DNA

<213> Human papillomavirus subtype 51 (6486-6897/412 bp)

<400> 665  
catttgctgg aacaatcagc tttttattac ctgtgttgat actaccagaa gtacaaattt 60  
aactattagg actgccactg ctgcgggttc cccaacattt actccaagta actttaagca 120  
atatattagg catggggaag agtatgaatt gcaattttatt ttccaattat gtaaaattac 180  
tttaactaca gaggtaatgg cttattttaca cacaatggat cctaccattc ttgaacagtg 240  
gaatttttga ttaacattac ctccgtctgc tagtttggag gatgcatata ggtttgttag 300  
aaatgcagct actagctgtc aaaaggacac cctccacag gctaagccag atcctttggc 360  
caaatataaa ttttgggatg ttgatttaaa ggaacgattt tcttttagatt ta 412

<210> 666

<211> 409

<212> DNA

<213> Human papillomavirus subtype 52 (6623-7031/409 bp)

<400> 666  
catatgttgg ggcaatcagt tgtttgtcac agttgtggat accactcgta gcactaacat 60  
gactttatgt gctgagggtta aaaaggaaag cacatataaa aatgaaaatt ttaaggaata 120  
ccttcgtcat ggcgaggaaat ttgattttaca atttattttt caattgtgca aaattacatt 180  
aacagctgat gttatgacat acattcataa gatggatgcc actatttttag aggactggca 240  
atttggcctt accccaccac cgtctgcac tttggaggac acatacagat ttgtcacttc 300  
tactgctata acttgtcaaa aaaacacacc acctaaagga aaggaagatc ctttaaagga 360  
ctatatgttt tgggaggtgg atttaaaaga aaagttttct gcagattta 409

<210> 667

<211> 409

<212> DNA

<213> Human papillomavirus subtype 53 (6614-7022/409 bp)

<400> 667  
catctgttgg aacaatcagt tatttgtaac tgttgtggat accaccagga atacaaacat 60  
gactctttcc gcaaccacac agtctatgtc tacatataat tcaaagcaaa ttaaacagta 120  
tgtagacat gcagaggaaat atgaattaca atttgtgttt caactatgta aaatatccct 180  
gtctgctgag gttatggcct atttacatac tatgaattct accttactgg aagactggaa 240  
tataggtttg tcgcctcctg ttgccactag cttagaggac aaatacagat atgtgaaaag 300  
tgcagctata acctgtcaaa aggatcagcc cctcctgaa aagcaggacc cactatctaa 360  
atataaattt tgggaggtca atttgcaaaa cagtttttct gctgatttg 409

<210> 668

<211> 412

<212> DNA

<213> Human papillomavirus subtype 54 (6561-6972/412 bp)

<400> 668

tatttggttg	ggcaatcagg	tggttttaac	agttgtagat	accacccgta	gtactaacct	60
aacatttgt	gctacagcat	ccacgcagga	tagctttaat	aattctgaat	ttagggagta	120
tattagacat	gtggagggaat	atgatttaca	gtttatat	cagttatgta	ccataaccct	180
tacagcagat	gttatggcct	atattcatgg	aatgaatccc	actattctag	aggactggaa	240
ctttggtata	acccccccag	ctacaagtag	tttggaggac	acatataggt	ttgtacagtc	300
acaggccatt	gcatgtcaaa	agaataatgc	ccctgcaaag	gaaaaggagg	atccttacag	360
taaattta	ttttggactg	ttgaccttaa	ggaacgattt	tcattctgacc	tt	412

<210> 669

<211> 419

<212> DNA

<213> Human papillomavirus subtype 56 (6559-6967/409 bp)

<400> 669

catttgctgg	ggtaatcaat	tatttggttac	tgtagtagat	actactagaa	gtactaacat	60
gactattagt	actgctacag	aacagttaag	taaatatgat	gcacgaaaaa	ttaatcagta	120
ccttagacat	gtggagggaat	atgaattaca	atttggtttt	caattatgca	aaattacttt	180
gtctgcagag	gttatggcat	atttacataa	tatgaatgct	aacctactgg	aggactggaa	240
tattgggtta	tccccgccag	tgcccaccag	cctagaagat	aaatatagat	atgttagaag	300
cacagctata	acatgtcaac	gggaacagcc	accaacagaa	aaacaggacc	cattagctaa	360
atataaattt	tgggatgtta	acttacagga	cagtttttct	acagacctgg	atcaatttc	419

<210> 670

<211> 409

<212> DNA

<213> Human papillomavirus subtype 58 (6608-7016/409 bp)

<400> 670

catttgctgg	ggcaatcagt	tatttggttac	cgtggttgat	accactcgta	gcactaatat	60
gacattatgc	actgaagtaa	ctaaggaagg	tacatatata	aatgataatt	ttaaggaata	120
tgtacgtcat	gttgaagaat	atgacttaca	gtttgttttt	cagctttgca	aaattacact	180
aactgcagag	ataatgacat	atatacatat	tatggattcc	aatatttttg	aggactggca	240
atttggttta	acacctcctc	cgtctgccag	tttacaggac	acatatagat	ttgttacctc	300
ccaggctatt	acttgccaaa	aaacagcacc	ccctaaagaa	aaggaagatc	cattaaataa	360
atatactttt	tgggaggtta	acttaaagga	aaagttttct	gcagatcta		409

<210> 671

<211> 415

<212> DNA

<213> Human papillomavirus subtype 59 (6571-6985/415 bp)

<400> 671

tatatgttgg	cacaatcaat	tggttttaac	agttgtagat	actactcgca	gcaccaatct	60
ttctgtgtgt	gcttctacta	citcttctat	tcctaattga	tacacacctt	ccagttttta	120
agaatatgcc	agacatgtgg	aggaatttga	tttgcagttt	atatttcaac	tgtgtaaaaa	180
aacattaact	acagaggtta	tgtcatacat	tcataatatg	aataccacta	ttttggagga	240
ttggaatttt	ggtgttacac	cacctcctac	tgctagttta	gttgacacat	accgttttgt	300
tcaatctgct	gctgtaactt	gtcaaaaagga	caccgcaccg	ccagttaaac	aggaccttta	360

tgacaaacta aagttttggc ctgtagatct taaggaaagg ttttctgcag atctt

415

<210> 672

<211> 415

<212> DNA

<213> Human papillomavirus subtype 61 (6732-7146/415 bp)

<400> 672

tatttggttg	tttaatgaat	tgtttgtaac	cgttggtgat	accacccgca	gtactaattt	60
aaccatttgt	actgctacat	ccccccctgt	atctgaatat	aaagccacaa	gctttaggga	120
atatttgcgc	catacagagg	agtttgattt	gcaattttatt	tttcagttat	gtaaaataca	180
tttaacccct	gaaattatgg	cctacctaca	taatatgaat	aaggccttgt	tggtgactg	240
gaactttggt	gtggtaccac	cacctctac	cagtttagaa	gacacatata	ggtttttgca	300
gtccagagct	attacatgtc	agaaggggtg	tgctgccccg	ccgccaagg	aggatcgcta	360
tgccaagtta	tccttttgga	ctgttgattt	acgagacaag	ttttccactg	atttg	415

<210> 673

<211> 409

<212> DNA

<213> Human papillomavirus subtype 62 (21-429/409 bp)

<400> 673

tatttggttg	tttaatgaac	tgtttgttac	tgtggtgat	actaccagaa	gtactaattt	60
tactatttgt	accgcctcca	ctgctgcagc	agaatacacg	gctaccaact	ttagggaatt	120
tttgcgacac	acggaggaat	ttgatttgca	atttatattt	caattgtgca	aaatacagtt	180
aacccccgaa	attatggcct	acctgcataa	tatgaacaag	gaccttttgg	atgactggaa	240
ctttgggggt	ttacctcccc	cttccactag	tttagatgag	acatatcact	atttcgagtc	300
tcgggctatt	acatgtcaaa	gggggctgcc	taccggtccc	aagggtggacc	cgtatgcgca	360
aatgacattt	tggactgtgg	atcttaagga	caagttgtct	actgatttg		409

<210> 674

<211> 409

<212> DNA

<213> Human papillomavirus subtype 66 (6609-7017/409 bp)

<400> 674

catatgctgg	ggtaatcagg	tatttgttac	tgttgtgat	actaccagaa	gcaccaacat	60
gactattaat	gcagctaaaa	gcacattaac	taaatatgat	gcccgtgaaa	tcaatcaata	120
ccttcgccat	gtggaggaat	atgaactaca	gtttggtgtt	caactttgta	aaataacctt	180
aactgcagaa	gttatggcat	atttgcataa	tatgaataat	actttattag	acgattggaa	240
tattggctta	tccccaccag	ttgcaactag	cttagaggat	aaatataggt	atattaaaag	300
cacagctatt	acatgtcaga	gggaacagcc	ccctgcagaa	aagcaggatc	ccctggctaa	360
atataagttt	tgggaagtta	atttacagga	cagcttttct	gcagacctg		409

<210> 675

<211> 409

<212> DNA

<213> Human papillomavirus subtype 67 (6584-6992/409 bp)

<400> 675

tatatgctgg	ggtaatcaaa	tatttgttac	tgttgtagac	actacacgta	gtaccaacat	60
gactttatgt	tctgaggaaa	aatcagaggc	tacatacaaa	aatgaaaact	ttaaggaata	120
cccttagacat	gtggaagaat	atgatttgca	gtttatatatt	cagctgtgca	aaatatccct	180



tactgcaaat	ggtatgcaat	acatacacac	catgaatcca	gatataattag	aggactggca	240
atttggcctt	acaccacctc	cttcaggtaa	tttacaggac	acatatagat	ttgttacctc	300
gcaggctatt	acctgtcaaa	aaacatcccc	tccaacagca	aaggaagatc	ctcttaaaaa	360
gtacagtttt	tgggaaatca	atttaaagga	aaaattttct	gcagattta		409

<210> 676

<211> 415

<212> DNA

<213> Human papillomavirus subtype 68 (2582-2996/415 by)

<400> 676

tatttgtttg	cataatcaat	tatttcttac	tgttgtggat	accactcgca	gtaccaat	60
tactttgtct	actactactg	aatcagctgt	accaaattatt	tatgatccta	ataaatttaa	120
ggaatatatt	aggaatggtg	aggaatatga	tttgcaat	atatttcagt	tgtgtactat	180
aacattgtcc	actgatgtaa	tgctctatat	acatactatg	aatcctgcta	ttttggatga	240
ttggaat	ggtgttgccc	ctccaccatc	tgctagtctt	gtagatacat	accgctatct	300
gcaatcagca	gcaattacat	gtcaaaaaga	cgccctgca	cctactaaaa	aggatccata	360
tgatggccta	aacttttggg	atgtaaattt	aaaggaaaag	tttagttctg	aactg	415

<210> 677

<211> 415

<212> DNA

<213> Human papillomavirus subtype 69 (6509-6923/415 bp)

<400> 677

catttgtttg	ggcaaccaat	tgtttgttac	ttgtgtagat	actaccgcga	gtaccaacct	60
cactattagt	actgtatctg	cacaatctgc	atctgccact	tttaaaccat	cagattataa	120
gcagtttata	aggaatggtg	aggaatatga	attacagttt	atatttcaat	tgtgtaaaaa	180
tactcttacc	actgatgtaa	tgccctatat	ccatacaatg	aattctacta	ttttggaaaa	240
ttggaat	ggccttacct	tgccctctac	tgctagtttg	gaagatgcat	ataggtttat	300
taaaaattca	gctactacat	gtcaacgcga	tgccctgca	cagccaagg	aggatccatt	360
tagtaaatta	aaattttggg	acgttgatct	taaagaaaag	ttttctattg	attta	415

<210> 678

<211> 409

<212> DNA

<213> Human papillomavirus subtype 6 (6743-7151/409 bp)

<400> 678

tatttgtttg	ggtaatcaac	tgtttgttac	tgtggttagat	accacacgca	gtaccaacat	60
gacattatgt	gcatccgtaa	ctacatcttc	cacatacacc	aattctgatt	ataaagagta	120
catgcgtcat	gtggaagagt	atgatttaca	atttattttt	caattatgta	gcattacatt	180
gtctgctgaa	gtaatggcct	atattcacac	aatgaatccc	tctgttttgg	aagactggaa	240
ctttgggtta	tcgctcccc	caaatggtac	attagaagat	acctataggt	atgtgcagtc	300
acaggccatt	acctgtcaaa	agcccactcc	tgaaaaggaa	aagccagatc	cctataagaa	360
ccttagtttt	tgggagggta	atttaaaaaga	aaagttttct	agtgaattg		409

<210> 679

<211> 415

<212> DNA

<213> Human papillomavirus subtype 70 (6549-6963/415 bp)

<400> 679

catttggttg	cataaccagt	tgtttattac	tgtggtggac	actacacgta	gtactaattt	60
tacattgtct	gcctgcaccg	aaacggccat	acctgctgta	tatagcccta	caaagtttaa	120
ggaatatact	aggcatgtgg	aggaatatga	tttacaattt	atatttcaat	tgtgtactat	180
cacattaact	gctgaacgta	tggcctacat	ccatactatg	aatcctgcaa	ttttggacaa	240
ttggaatata	ggagttaccc	ctccaccatc	tgcaagcttg	gtggacacgt	ataggtattt	300
acaatcagca	gctatagcat	gtcaaaagga	tgctcctaca	cctgaaaaaa	aggatcccta	360
tgacgattta	aaattttggg	atgttgattt	aaaggaaaag	tttagtacag	aacta	415

<210> 680

<211> 415

<212> DNA

<213> Human papillomavirus subtype 72 (6758-7172/415 bp)

<400> 680

catctggttg	tttaatgagc	tttttgtgac	agttgtagat	actactcgca	gtactaatgt	60
aactatattgt	actgccacag	cgctcctctgt	atcagaatat	acagcttcta	attttcgtga	120
gtatcttcgc	cacactgagg	aatttgattt	gcagtttata	tttcaactgt	gtaaaattca	180
cttaactcct	gaaattatgg	cctacttgca	caatatgaat	aaggccttat	tggatgactg	240
gaattttggg	gtggtgcctc	ctccttctac	cagtttggat	gatacctata	ggtttttgca	300
gtctcgtgcc	attacctgtc	aaaagggggc	tgccaccctc	cctcctaaag	aagatccata	360
tgctaactta	tccttttggg	ctgtggattt	aaaggacaaa	ttttccactg	acttg	415

<210> 681

<211> 415

<212> DNA

<213> Human papillomavirus subtype 74 (1613-2027/415 bp)

<400> 681

tatttggttg	ggtaatcaat	tatttgttac	agttgtggat	accacacgca	gtactaacat	60
gactgtgtgt	gctcctacct	cacaatcgcc	ttctgctaca	tataatagtt	cagactacaa	120
acaatacatg	cgacatgtgg	aggaatttga	tttgcaattt	atttttcaat	tatgtagtat	180
taagttaact	gctgaggtta	tggcctatat	tcatactatg	aatcctacag	ttttagaaga	240
gtggaacttt	gggctaacgc	ctccccccaa	tggtacttta	gaagacacct	acagatatgt	300
gcagtcccag	gctattacat	gtcaaaaacc	tacgcctgat	aaagcaaagc	ccaatcccta	360
tgcaaattta	agtttttggg	aagttaatct	taaggaaaag	ttttctagt	aatta	415

<210> 682

<211> 415

<212> DNA

<213> Human papillomavirus subtype 82 (6536-6950/415 bp)

<400> 682

catttgctgg	aataatcagc	tttttattac	ttgtgttgac	actactaaaa	gtaccaattt	60
aaccattagc	actgctgtta	ctccatctgt	tgcacaaaca	tttactccag	caaactttaa	120
gcagtacatt	aggcatgggg	aagaatatga	attgcaattt	atatttcaat	tgtgtaaaat	180
cactttaact	actgaaatta	tggcttacct	gcacaccatg	gattctacaa	ttttagaaca	240
gtggaatttt	ggattaacat	tgccccctc	cgctagtttg	gaggatgcct	atcgatttgt	300
aaaaaatgca	gcaacatcct	gtcacaagga	cagtcctcca	caggctaaag	aagacccttt	360
ggcaaaatat	aaattttggg	atgtagacct	taaggaaacgc	ttttcttttg	atttg	415

<210> 683

<211> 412

<212> DNA

<213> Human papillomavirus subtype CP8061 (21-432/412 bp)

<400> 683

catttggttg	ggcaatcagc	tttttgtaac	agttgtggac	acatcacgta	gtacaaatat	60
gtccatctgt	gctacaaaa	ctgltgagtc	tacatataaa	gcctctagtt	tcattggaata	120
tttgagacat	ggagaagaat	ttgatttgca	atztatattt	caactatgtg	ttattaattt	180
aacagctgaa	attatggcct	acttacatcg	catggatgct	acattactgg	aggactggaa	240
tttttggttc	ttaccacctc	ctactgctag	tcttggtgat	acctaccgct	ttttacagtc	300
tcaggccata	acctgtcaga	aaaacagtc	tcctctcgca	gaaaaaaagg	accttatgc	360
agatcttaca	ttttgggagg	tggatttaaa	ggagcggttt	tcactagaat	tg	412

<210> 684

<211> 412

<212> DNA

<213> Human papillomavirus subtype CP8304 (21-432/412 bp)

<400> 684

tatttggttg	tttaatgaaa	tggttggttac	agtgggtgat	actaccagaa	gcaccaattt	60
tactatttgc	acagctacat	ctgctgctgc	agaatacaag	gcctctaact	ttaaggaatt	120
tctgcgccat	acagaggaat	atgatttgca	gtttattttc	caattatgta	aaatacagtt	180
aacaccagaa	attatggcct	acttacataa	tatgaacaag	gcactggttg	atgattggaa	240
ttttggtgtg	ttgccacctc	cttcaccag	tttagatgac	acatatcgct	ttttacagtc	300
tcgggccatt	acctgtcaaa	agggtgctgc	tgccctgcg	cccaaagagg	accttatgc	360
cgacatgtca	ttttggacag	ttgaccttaa	ggacaagttg	tctactgatt	tg	412

<210> 685

<211> 350

<212> DNA

<213> Human papillomavirus subtype L1AE5 (11-360/350 bp)

<400> 685

ggcacaacca	attattttata	actgtggtag	acacaacacg	tagtaccaat	cttacottat	60
ctactgcaac	tactaatcca	gttccatcta	tatatgaacc	ttctaaattt	aaggaatata	120
cacgccatgt	agaggaatat	gatttacaat	ttatatctca	attgtgtaaa	attacactta	180
ctactgatgt	tatgtcttat	atacataaca	tggatcctac	tatttttagat	agttggaatt	240
ttggtggttag	tcctcccca	tctgctagct	tagtagatac	atataggttt	ttacagtoat	300
ctgccattac	atgtcagaag	gatgtggttg	ttccacaaaa	aaaggatcca		350

<210> 686

<211> 415

<212> DNA

<213> Human papillomavirus subtype MM4 (21-435/415 bp)

<400> 686

catttgctgg	aataatcagc	tttttattac	ttgtgttgac	actactagaa	gtaccaattt	60
aaccattagc	actgctgtta	ctcaatctgt	tgcacaaaca	tttactccag	caaactttaa	120
gcaatacatt	aggcatgggg	aagaatatga	attgcaattt	atatttcaat	tgtgtaaaat	180
cactttaact	actgaaatta	tggcttacct	gcacaccatg	gattctacaa	ttttagaaca	240
gtggaatttt	ggattaacct	tgccccctc	agctagtttg	gaggatgcct	atcgatttgt	300
aaaaaatgca	gcaacatcct	gtcacaagga	cagtcctcca	caggctaaac	aagacctttt	360
ggcaaaatat	aaatttttga	atgtagacct	taaggaaacgc	ttttcttttg	atttg	415

<210> 687

<211> 412

<212> DNA

<213> Human papillomavirus subtype MM7 (21-432/412 bp)

<400> 687

catttggttg	tttaatgagt	tatttggttac	agttgtagat	actacccgca	gtaccaatat	60
tactatttca	gctgctgcta	cacaggctaa	tgaatacaca	gcctctaact	ttaaggaata	120
cctccgccac	acogaggaat	atgacttaca	ggttatattg	caactttgca	aaatacatct	180
taccctgaa	attatggcat	acctacatag	tatgaatgaa	catttattgg	atgagtggaa	240
ttttggcgtg	ttaccacctc	cttccaccag	ccttgatgat	acctatcgct	atctgcagtc	300
ccgtgctatt	acctgccaaa	agggtccttc	cgccccctgcc	cctaaaaagg	atccttatga	360
tggccttgta	ttttgggagg	ttgatttaaa	ggacaaacta	tccacagatt	tg	412

<210> 688

<211> 412

<212> DNA

<213> Human papillomavirus subtype MM8 ( 21-432/412 bp)

<400> 688

tatatgctgg	tttaatcaat	tgtttggtcac	ggtggtggat	accacccgca	gcaccaattt	60
tactattagt	gctgctacca	acaccgaatc	agaatataaa	cctaccaatt	ttaaggaata	120
cctaagacat	gtggaggaat	atgatttgca	gttttatattc	cagttgtgta	aggcccgctct	180
gactccagag	gtcatgtcct	atttacatac	tatgaatgac	tccttattag	atgagtggaa	240
ttttggtggt	gtgccccctc	cctccacaag	tttagatgat	acctataggt	acttgcagtc	300
tcgcgccatt	acttgccaaa	agggggccgc	cgccgccaaag	cctaagggaag	atccttatgc	360
tggcatgtcc	ttttgggatg	tagatttaaa	ggacaagttt	tctactgatt	tg	412